NJDEP Site Remediation Program, Passaic River team comments on Passaic River RM 10.9 Characterization Addendum D, December 14, 2012

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The purpose of Addendum D is to collect additional site-specific data for cap design and sediment disposal purposes. The proposed key activities include collection of sediment and pore water samples as follows: collection of representative pore water from select locations in the removal area for target chemical analyses; collection of sediment cores to be held for possible mercury treatability studies; collection of sediment cores for TCLP analysis for disposal purposes; and collection of sediment core samples for stabilization treatability studies for disposal purposes.

General Comment: The sampling scheme is complex and is designed for efficiency of both sample collection and analysis to address multiple objectives. This has merit. However, a sample summary table to supplement Table 3 is needed to provide improved clarity of the proposed sampling and analysis program; please refer to comment 2 below.

Specific Comments:

1. Sampling Objectives (pages 5 & 6 of 9): In addition to the stated objectives, there are three additional data gaps that could be addressed by this addendum and should be considered: collection of representative near surface pore water (existing 0-2 ft cores) to provide project *baseline* conditions for comparison purposes in the long term monitoring program (Appendix K); collection of representative whole sediment samples from the 0-2 ft. interval for Dioxin/Furan analysis since this parameter is not covered under the TCLP testing; and collection of a few "co-located" cores matched to 2011 characterization work to determine degree, if any, of Hurricane Sandy impacts. These are addressed further in comments 3, 8 and 12, respectively, below.

2. "Sediment Core Collection" and Table 2: **Observation**: There appear to be inconsistent statements about the number of sediment core samples to be collected and the analyses to be performed on them. The Department's understanding of what the sampling and analysis scheme appears to be is as follows: 25 sampling locations (as shown on Figure 1)

    - 12 locations of 4 ft cores – pore water collection for 1 composite analysis, sediment stabilization testing, Hg treatability studies
        - 0-2 foot depths of each core – TCLP analyses
        - 0-2 foot depths of each core – sediment stabilization studies
        - 2-4 foot depths of each core – pore water collection
        - 2-4 foot depths of 10 cores with highest [Hg] – Hg treatability study
        - 0-2 foot depths of 8 cores with highest [Hg] – no analyses
    - 13 locations – TCLP analyses
        - 0-2 foot depths of each core – TCLP analyses
        - 2-4 foot depths of each core – no analyses

Comment: **a**. Under the heading of Sampling and Analysis Approach, separate headings and descriptions for "Sediment Sampling" (exists) and "Pore Water Sampling" should be provided to improve understanding of the program. **b**. As mentioned under General Comments, a Sample Summary Table is needed to identify each selected sample location, number of discrete cores (4ft lengths) per location, number of intervals per core and the number and types of analyses per interval. For example, under Sediment Sampling, the text states that a total of "47 sediment cores will be collected". It is not clear if these are physically distinct core samples (which would require duplicate core samples to be collected at some locations) or represent some combination of individual depth strata (0-2 foot and 2-4 foot depths) within each core sample collected at each location. Bullets #1 and #2 on page 5 of 9 imply that these will be physically distinct core samples. Improved clarification needed.

3. Sediment Sampling, page 6-9, para. #2: This section states that "…24 core segments (2-4ft. interval) will be processed for pore water characterization….". This implies 1 composite sample from 24 locations. **Comment**: Given the lack of any pore water data for this area, one pore water sample is considered insufficient for characterizing the potential variability in pore water across the removal area, taking into consideration both physical and chemical differences that may exist from north to south across the area to be capped. CPG should re-evaluate this approach and propose collection of pore water composite samples by grouping similar cores among the 24 target areas. This should result in a minimum of 4 – 6 composite samples, if possible, depending on analytical volume needs. These data can also become part of the baseline information needed for long term monitoring purposes (Appendix K).

4. Related to comment 3 above, the procedure to form the pore water composite samples must be specified (for example, equal volume of pore water from each individual core sample used, or all of the pore water from each core sample?).

5. Table 2: This table indicates that the 2-4 foot depth strata of the sample cores will be stored for a potential Hg treatability study. However, Worksheet 14 – Sediment processing, states that the 0-2 foot depth strata will be handled this way. Clarification needed.

6. Related to comment 5 above, the QAPP should describe the objectives and scope of the sediment stabilization and Hg treatability studies.

7. Sediment Core Location Selection, Table 4: The Department appreciates the level of detail and evaluation that went into the core selection process and generally agrees with the overall approach and outcome.
   Observation: The averaging process used has apparently resulted in the proposed core location with the 4th highest 2,3,7,8-TCDD concentration (based on existing data) not being included in the proposed sampling scheme. This was because the location with the 13th highest 2,3,7,8-TCDD concentration had the highest PAH concentrations (11B-0316). However, the 2,3,7,8-TCDD concentration at location 11B-0316 is substantially lower than that in the remaining "top ten" locations. Likewise, the sample location with the 10th highest total PCB concentration has not been included – in its place, the sample with the 15th highest concentration is proposed for use

(11B-0344). However, the total PCB concentration at location 11B-0344 is substantially lower than that in the remaining "top ten" locations. **Comment**: It is recommended that additional samples are collected at the locations with the 4th highest 2,3,7,8-TCDD and 10th highest total PCB concentrations.

8. Sample Analysis (page 7 of 9): As mentioned in comment 1 above, whole sample analysis for PCDDs/PCDFs using USEPA Method 1613b, or equivalent, is recommended for sediment characterization disposal purposes, since TCLP testing does not cover this key contaminant. Sample cores should be targeted for areas known/expected to have the highest dioxin TEQ concentrations based on existing data. If sediment volumes permit, representative cores designated for TCLP analysis could be used for this purpose.

9. Sample Analysis, (Page 7 of 9)**:** The QAPP states that "upon receipt of the sediment cores, ASL will process the core segments designated for pore water via centrifugation to separate the pore water from the sediment particles." Centrifugation has several drawbacks, including typically higher chemical detection limits due to small volumes of pore water extracted, disruption of the integrity of the interstitial pore space and creation of conditions (e.g., altered redox or pH) whereby pore-water chemical form or speciation may be altered (ITRC 2011). However, for the current project, this method of pore water collection is acceptable. *Sidenote for consideration*: If these data will be used for baseline conditions (as suggested by the Department in comments 1 & 3 above) consideration should be given to how comparable the data generated from the proposed pore water collection method will be with future pore water collection and analysis for long term cap monitoring purposes.

10. Standard Operating Procedure for the Ex-Situ Extraction of Interstitial Water from Sediment Samples (Page 4 of 7)**:** The SOP states that the centrifuge speed will be "5,000 RPM." USEPA 2001 recommends a centrifugation speed of 8,000-10,000 RPM. CH2M Hill should provide justification for the chosen centrifuge speed.

11. Worksheet #11, Step 2 - Principal Study Questions (page 32): Question #2 is "Can the dredged material be disposed in a landfill without additional treatment?" However, the proposed Removal Action includes the stabilization of the dredged material with Portland cement (i.e. "additional treatment"). Is this referring to treatment beyond stabilization? Please clarify.

12. Worksheet 11, Step 2 – Decisions Statements on Collection of Representative Sediment Samples (pages 33-34) and Step 5 – Anticipated Data Evaluations (pages 36-37): The comparisons are limited to the results of TCLP analyses. No bulk sediment chemistry analyses are included in the proposed work. To evaluate the representativeness of the proposed core samples, especially given possible changes in sediment characteristics due to Hurricane Sandy, bulk sediment chemistry analyses should be conducted on representative core samples/depth strata to be collected.

13. Worksheet 18: should also identify those samples/depth strata to be used for the sediment stabilization and Hg treatability studies, as well as that the 0-2 foot depth strata at the 12 "pore

water locations" will also be subject to TCLP analyses.

14. Worksheet 19: This lists the minimum sample size for water analyses (pore water) as 2 liters for each of the organic contaminant analyses and 500 mL each for the Hg and methyl-Hg analyses. This sample size will require the collection of multiple core samples at each location. It is not clear if this has been adequately addressed; clarification recommended (related to comment 2).

15. Worksheet 20: Please describe how the water "field quality control" samples be collected, and their relevance to the collection of sediment core samples. It is noted that Worksheet 28 does not include any of these as "QC Samples".

16. All applicable Worksheets should be updated and amended to reflect the comments ultimately incorporated into Addendum D.

References

ITRC. 2011. *Incorporating Bioavailability Considerations into the Evaluation of Contaminated Sediment Sites*. Interstate Technology & Regulatory Council 444 North Capitol Street, NW, Suite 445, Washington, DC 20001. http://www.itrcweb.org/contseds-bioavailability/.

USEPA. 2001. *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual.* EPA/823/B-01/002. Washington, D.C.: Office of Water. http://www.nj.gov/dep/srp/guidance/srra/ecological_evaluation.pdf.